CMC

QUIK CHEK® TEST SET operating manual

CMC 707A
CMC 707B
CMC 710A
CMC 710-I

MODELS 707A & 707B

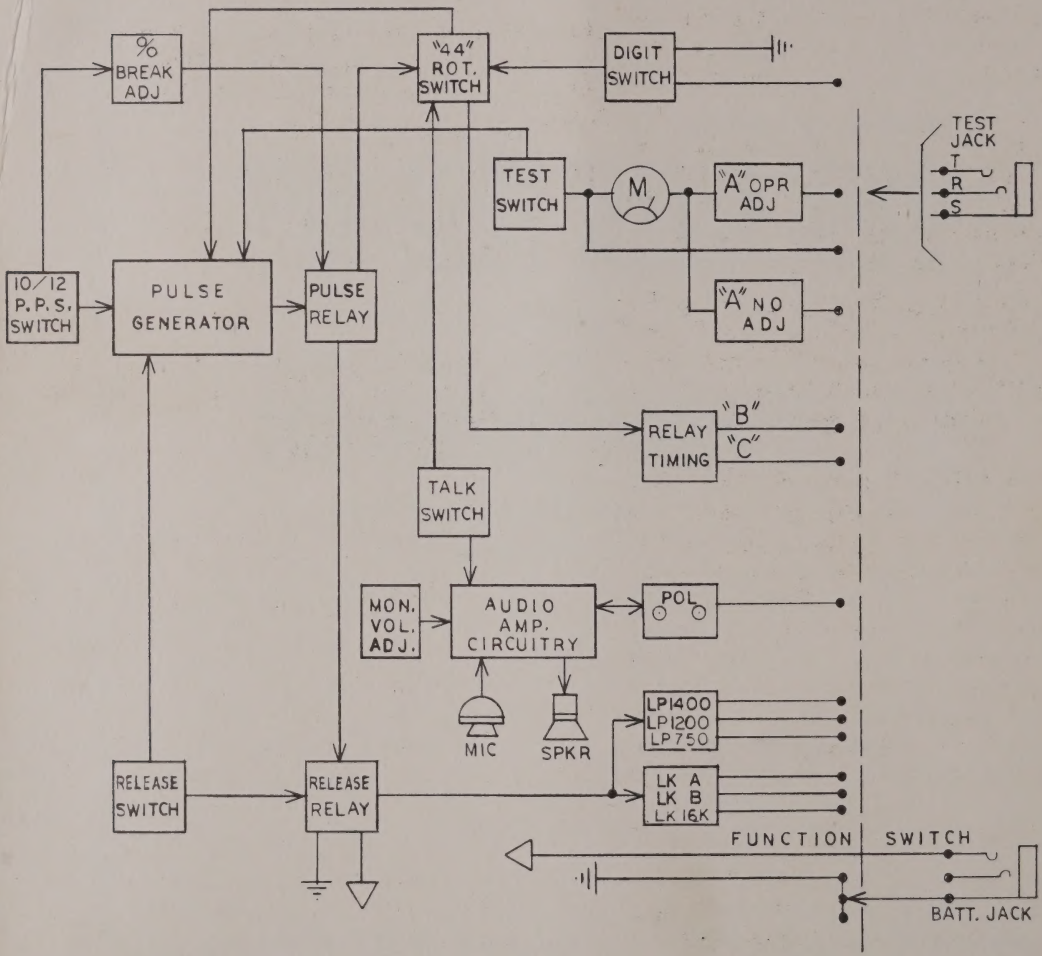
QUIK CHEK® TEST SET

- LOOP DIALING
- LOCAL SWITCH TRAIN

OPERATING INSTRUCTIONS

- BLOCK DIAGRAM
- WARRANTY

707 QUIK CHEK BLOCK DIAGRAM



1. GENERAL

1.01 This section provides instructions on the use and operation of the CMC 707A and 707B QUIK CHEK Test Sets. This set shall be used for determining necessary repairs on PBX, CDO, and large step-by-step offices.

The CMC 707A QUIK CHEK is designed for use by the Associated Bell System Companies where the "B" relay release values are 500 and 750 milliseconds for the readjust and test values respectively.

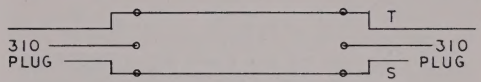
The CMC 707B QUIK CHEK is designed for use by companies using Automatic Electric switches or others where the "B" relay release values are 375 and 500 milliseconds for the readjust and test values respectively.

1.02 The CMC 707 Quik Chek Test Set is used in testing the operation of the local switches and trunks in Step-by-Step offices. It tests operation of the "A" relay, the "B" release (test or readjust values), "C" release and rotary speed test. It tests polarity of the switch and trunks, and any digit absorbing features. The operator can monitor wiper and switch noise, tones and announcements, and talk over circuits when required. Complete loop and leak tests can be made.

1.03 CORDS REQUIRED

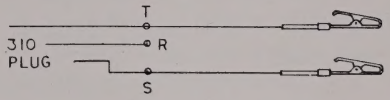
a. Power cord: Assembly 2P9A is a 2 conductor cord, 9 feet long, each end equipped with a 310 plug:

Figure 1.



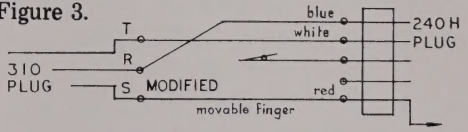
For offices and dial PBX's equipped with battery and ground clip-on terminals, use a 2W12A cord assembly, one end of which is equipped with alligator clips:

Figure 2.



b. Test cord: Assembly 3P35A is a 3 conductor cord, 9 feet long, one end equipped with a 310 plug and the other with a 240H plug, modified as follows:

Figure 3.



1.04 CONNECTIONS

a. Insert the 310 plug of the power cord into the "BATT" jack on the face of the QUIK CHEK and connect the other end to 48V C.O. battery.

b. Insert the 310 plug of the test cord into the "TEST" jack of the QUIK CHEK and the 240H plug into the switch test jack.

1.05 TEST SET ARRANGEMENT

a. DIGIT SWITCH — at lower left corner of the face plate and numbered "1-10", "C", and "CAL". Pulses supplied correspond to the digit selected. "C" provides continuous pulsing, "CAL" is used to calibrate the set.

b. FUNCTION SWITCH — at lower right corner of face plate, provides for the following test settings:

A OPR	("A" relay, operate)
A SOAK	
A N.O.	("A" relay, non-operate)
B RLS.	("B" relay, release)
C RLS & ROT	("C" relay, release & rotary speed test)

POLARITY- MON.

LP 1400	10 or 12 PPS, 68.5%
LK A	10 or 12 PPS, 60.5%
LP 1200	10 or 12 PPS, 68.5%
LK B	10 or 12 PPS, 60.5%
LP 750	10 or 12 PPS, 68.5%
LK 16 K	10 or 12 PPS, 60.5%

c. TEST and RLS (release buttons) — located between DIGIT and FUNCTION SWITCHES.

d. RECEIVER-TRANSMITTER— used to check tones and recorded announcements. A "TALK" button and "VOLUME" control give the QUIK CHEK an amplified push-to-talk circuit.

e. MILLIAMMETER with 2 controls for setting the values of current to margin "A" relay.

f. 10PPS 12PPS — Either 10 or 12 pulses per second can be supplied to the switch under test. (B and C relay tests must be made using 12 PPS.)

g. POLARITY — observe burning RED or lamp for STRAIGHT or REVERSE indication.

h. BATT and TEST jacks in top of panel provide patching arrangement to C.O. battery and the switch under test.

j. 750 MS (707A Model)
500 MS (707B Model)
To make an operation test of the "B" relay at the test value, push the "TALK" button with the FUNCTION switch set at the "B RLS." position.

2. TESTS

2.01 PRELIMINARY:

a. Insert the POWER and TEST cords as outlined in paragraph 1.04.

b. Turn the FUNCTION SWITCH to the "A SOAK" position. Push "TEST" button. Turn FUNCTION SWITCH to the "A OPR" position, push the "TEST" button and adjust the MILLIAMMETER reading to the test value (15.1), readjust value (14.8) or other desired value by turning the "OPR. ADJ" knob. Release "TEST" button.

Return the FUNCTION SWITCH to "A SOAK" position. Push "TEST" button to soak the "A" relay. Release

"TEST" button. Turn FUNCTION SWITCH to the "A N.O." position. Push the "TEST" button and adjust the meter to the test value (13.9), readjust value (14.4) or other desired value by turning the "N.O. ADJ" knob. Release "TEST" button.

The QUIK CHEK SET is ready for routine use.

c. NOTE: If a subscriber is encountered during any test through misdialing or plugging into a busy switch, the QUIK CHEK operator may converse with him by turning the FUNCTION switch to the "POLARITY & MON." setting and operating the "TALK" button.

3. STEP-BY-STEP TESTS

3.01 This covers the tests which may be made with the QUIK CHEK TEST SET (Model CMC 707) on Step-by-Step switches in all types of Step-by-Step offices, including C.D.O.'s, Centrex, and PBX's.

3.02 The tests are as follows:

a. "A" Relay: This is a QUIK CHEK of "A" Relay using the current flow TEST values specified in the circuit requirement tables.

b. "B" Relay Release: This is a QUIK CHEK of the "B" Relay releasing time.

c. "C" Relay Release and Rotary-Selectors: This is a QUIK CHEK of the "C" Relay releasing time, cut in, and rotary stepping.

d. Polarity: This is a QUIK CHEK of the continuity and polarity of switches and selector level trunks.

e. Digit Absorbing: This is a QUIK CHEK of the digit absorbing features of selectors.

f. Loop Pulsing: This is a QUIK CHEK method of making loop pulsing tests on selectors and connectors.

g. Leak Pulsing: This is a QUIK CHEK method of making leak pulsing tests on selectors and connectors.

3.03 If it is found necessary to monitor and/or talk on a connection, set the FUNCTION switch on "POLARITY & MON." position. Monitor with the "TALK" key normal. To talk, the "TALK" key is held operated. The speaker is disconnected while talking. The "TALK" key is non-locking.

3.04 Local procedures should apply in busying out switches, trunks, etc.

3.05 Records of troubles found and other reports should be made as required locally.

3.06 The QUIK CHEK Test Set should be checked and calibrated periodically. See "CALIBRATION", Section 9.

4. EQUIPMENT AND APPARATUS REQUIRED

4.01 One QUIK CHEK Test Set, Model CMC 707.

4.02 One two conductor (P2A) test cord, 9

feet long equipped as follows:

a. Where BATT jacks are available — equip with a 310 plug at each end (2P9A Cord Assembly) (see FIG. 1, paragraph 1.03 a.)

b. Where BATT jacks are not available—equip one end with a 310 plug, and at the other end equip the tip and sleeve with an alligator clip (2W12A Cord Assembly) (see FIG. 2, paragraph 1.03 a.)

4.03 One 3 conductor (P3H) test cord, 9 feet long equipped with a 310 plug at one end, and a 240H plug at the other (3P35A Cord Assembly, modified) (see FIG. 3, paragraph 1.03 b.)

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5. PREPARATION ALL TESTS

STEP	ACTION	VERIFICATION
1	Insert the 310 plug of one end of the 2 conductor 2P9A cord into the "BATT" jack of the QUIK CHEK Test Set. Then insert the 310 plug at the other end of cord into the "BATT" jack in the bay. Note: If a "BATT" jack is not available, use the 2 conductor cord equipped with the alligator clips (Fig. 2). Clip the tip to a convenient source of fused (3 ampere) -48V battery, and the sleeve to ground.	
2	Insert the 310 plug of the 3 conductor (3P35A) cord into the "TEST" jack of the QUIK CHEK Test Set.	

6. METHOD

(A) "A" RELAY TEST

3	Set the FUNCTION switch to "A OPR" position. Insert the 240H plug into the test jack of the switch under test.	

STEP	ACTION	VERIFICATION
4	Operate the "TEST" key and adjust the "OPR. ADJ" rheostat until the meter reads the milliamps specified for the operate test requirement.	
5	Set the FUNCTION switch on "A N.O." position, operate the "TEST" key, adjust the "N.O. ADJ" rheostat until the meter reads the milliamps specified for the non-operate test requirement.	
6	With the "OPR" and "N.O." settings adjusted as in steps 4 and 5, operate the FUNCTION switch to "A SOAK" position. Operate the "TEST" key momentarily. Then set the "FUNCTION" switch to the "A OPR" position, and again operate the "TEST" key momentarily.	Note that the "A" Relay operates when the "TEST" key is operated.
7	Operate the FUNCTION switch to "A SOAK", operate the "TEST" key, change the "FUNCTION" switch to "A N.O." and operate the "TEST" key momentarily.	Note that the "A" Relay does not operate.
8	Remove the 240H plug from the test jack of the switch and insert it in the next switch to be tested; or if preferred, make other desired tests on the same switch.	

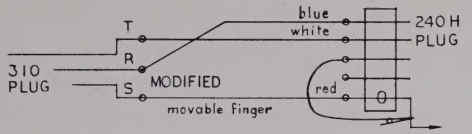
STEP	ACTION	VERIFICATION
9	Repeat steps 5, 6, 7 and 8 until all switches have been tested.	
10	Remove the 240H plug from last switch tested.	
	(B) RELAY RELEASE TEST	
3	Operate the FUNCTION switch to "B RLS" position.	
3 (A)	CMC 707A QUIK CHEK — The "B" relay can be checked at either the 500 milliseconds readjust value or the 750 milliseconds test value.	
3 (B)	CMC 707B QUIK CHEK — The "B" relay can be checked at either the 375 or the 500 millisecond readjust and test values.	
4	Operate DIGIT switch to "C" position for continuous pulsing.	
5	Operate the "PPS" switch to "12 PPS" position.	
6	Insert the 240H plug into the test jack of the switch under test.	
7 (A)	CMC 707A QUIK CHEK (Bell System) 500 Millisecond Test (The "B" release value is 500 milliseconds pulsed continuously when FUNCTION switch is in the "B RLS" position.)	

STEP	ACTION	VERIFICATION
	Operate the "TEST" key momentarily.	The switch steps to the 1st level; does not cut in; and releases; continuing as long as the 240H plug remains in the test jack.
	750 Millisecond Test Operate the "TEST" key momentarily and hold the "TALK" button in the operate position. (This changes the release value to 750 milliseconds.) The Talk circuit is operative only when the FUNCTION switch is in the "POLARITY & MON." position.	The switch steps to the 1st level; does not cut in; and releases; continuing as long as the 240H plug remains in the test jack.
7 (B)	CMC 707B QUIK CHEK (Independent Companies) 375 Millisecond Test (The "B" release value is 375 milliseconds pulsed continuously when FUNCTION switch is in the "B RLS" position.	
	Operate the "TEST" key momentarily.	The switch steps to the 1st level; does not cut in; and releases; continuing as long as the 240H plug remains in the test jack.
	500 Millisecond Test Operate the "TEST" key momentarily and hold the "TALK" button in the operate position. (This changes the release value to 500 milliseconds.) The Talk circuit is operative only when the FUNCTION switch is the "POLARITY & MON." position.	The switch steps to the 1st level; does not cut in; and releases; continuing as long as the 240H plug remains in the test jack.

STEP	ACTION	VERIFICATION
8	Remove the 240H plug from the switch under test and insert it in the test jack of the next switch to be tested. Or proceed to "C RLS & ROT" test on same switch.	The switch steps to the 1st level; does not cut in; and releases; repeating as long as the 240H plug remains in the test jack.
9	Repeat step 8 until all switches have been tested; operate the "RLS" key; and remove the 240H plug from the last switch tested.	The switch returns to normal and the pulsing in the test set stops.
	(C) "C" RELAY RELEASE & ROTARY TEST (SELECTORS)	
3	Operate the FUNCTION switch to "C RLS. & ROT." position.	
4	Operate the "DIGIT" switch to "C" position for continuous pulsing.	
5	Operate the "PPS" switch to "12 PPS" position.	
6	Insert the 240H plug into the test jack of the switch under test.	
7	Place the movable finger of the 240H plug so that it will make good contact with the sleeve wiper terminal just below the test jack springs. On some switches clip lead ground must be used in addition to the movable finger.	

STEP	ACTION	VERIFICATION

Figure 4.



8	Operate the "TEST" key momentarily.	The switch steps to the 1st level; cuts in; rotates to the 9th rotary step, and releases. Repeating as long as the 240H plug remains in the test jack.
9	Remove the 240H plug from the switch under test and insert it in the test jack of the next switch to be tested, or leave it in the same switch and make the "POLARITY" test.	The switch steps to the 1st level; cuts in; rotates to the 9th rotary step, and releases. Repeating as long as the 240H plug remains in the test jack
10	After all switches have been tested, operate the "RLS" key and remove the 240H plug from the last switch.	The switch returns to normal and the pulsing in the test set stops.
	(D) POLARITY TEST OF TRUNKS FROM SELECTOR LEVELS	
3	Operate the FUNCTION switch to the "POLARITY & MON." position.	
4	Operate the "DIGIT" switch to the number which corresponds to the level to be tested.	
5	Operate the "PPS" switch to position "10" or "12", whichever is appropriate.	

STEP	ACTION	VERIFICATION
6	Insert 240H plug into test jack of switch under test.	The switch is seized.
7	Operate the "TEST" key momentarily.	Switch steps up and cuts in on level indicated by DIGIT switch. Note: If STRAIGHT lamp or LED is burned out or broken the Quik Chek will not outpulse in POLARITY & MON. position. Replace with 24B or equivalent lamp, using standard lamp extracting tools. LED equipped sets should be checked with Simpson meter if no polarity or continuity indication is received.
	Flip switch across trunks.	Lamp burning indicates straight or polarity.
8	Operate "RLS" key momentarily.	The switch restores to normal.
9	Repeat steps 4, 7 and 8 until all levels have been tested.	
10	Remove 240H plug and repeat steps 4, 6, 7, 8, 9 until all trunks in all shelves have been tested.	Switch restores to normal.
11	Remove 240H plug from last switch.	Switch restores to normal.
	(E) DIGIT ABSORBING TEST	
3	Operate FUNCTION switch to "POLARITY & MON" position.	
4	Operate "DIGIT" switch to the number which corresponds to the level to be tested.	
5	Operate "PPS" switch to position "10" or "12", whichever is appropriate.	

STEP	ACTION	VERIFICATION
6	Insert the 240H plug into the test jack of the switch under test.	Switch is seized.
7	Operate the "TEST" key momentarily.	The switch steps to the level indicated by the DIGIT switch and: 1. If digit absorbed — the switch releases. 2. If unlocked — the switch cuts in to 1st idle trunk.
8	Repeat step 7 until all digit absorbing features on all digit absorbing levels have been tested.	
9	Operate "RLS" key and remove the 240H plug from the switch under test.	Switch restores to normal.
10	Repeat steps 7, 8 and 9 until all switches have been tested.	
	(F) LOOP PULSING TEST	
3	Operate FUNCTION switch to the required Loop position. (LP.1400,LP.1200,or LP.750)	
4	Operate DIGIT switch to "9" position.	
5	Operate the "PPS" switch to "10" or "12", whichever is appropriate.	
6	Insert the 240H plug into the test jack of the switch under test. Note: On some switches it is necessary to separate contacts 5 & 6 of the test jack	Switch is seized.

STEP	ACTION	VERIFICATION
	assembly with an orange stick in order to perform pulsing tests.	
7	Operate the "TEST" key momentarily.	Observe that the switch steps evenly to the 9th level and cuts in to the first idle trunk.
8	Operate the "RLS" key and remove 240H plug from test jack of switch.	Switch restores to normal.
9	Repeat steps 6, 7 and 8 until all switches have been tested.	
	(G) LEAK PULSING TESTS	
3	Operate the FUNCTION switch to the required Leak position (LK.A, LK.B, LK.16K).	
4	Operate DIGIT switch to "9" position.	
5	Operate the "PPS" switch to "10" or "12", whichever is appropriate.	
6	Insert the 240H plug into the test jack of the switch under test. Note: On some switches it is necessary to separate contacts 5 & 6 of the test jack assembly with an orange stick in order to perform pulsing tests.	Switch is seized.
7	Operate the "TEST" key momentarily.	Observe that the switch steps evenly to the 9th level and cuts in to the first idle trunk.

STEP	ACTION	VERIFICATION
8	Operate the "RLS" key and remove the 240H plug from test jack of switch.	Switch restores to normal.
9	Repeat steps 6, 7 and 8 until all switches have been tested.	

7. ROTARY OUT-TRUNK SWITCHES

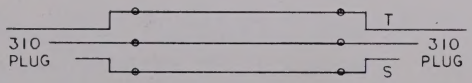
7.01 This section describes a method of rapid testing the continuity and polarity of 3 wire Rotary out-trunk switches using CMC 707A QUIK CHEK Test Set.

7.02 CORDS REQUIRED:

a. Power Cord: Assembly 2P9A is a 2 conductor cord, 7 feet long, each end equipped with 310 plugs. (see Fig.1)

b. Test Cord: Assembly 3P7A is a 3 conductor cord, 9 feet long, each end equipped with 310 plugs.

Figure 5.



7.03 CONNECTIONS:

a. Insert the 310 plug of 2P9A power cord into the BATT jack on the face of the QUIK CHEK Test Set and connect the other end to 48V C.O. Batt.

b. Insert the 310 plug of 3P7A Test Cord into the "TEST" jack on the face of the QUIK CHEK Test Set and connect the other end into test jack of switch under test.

7.04 TEST SET ARRANGEMENT:

a. Digit Switch
   1. Set on "1".

b. Function Switch
   1. Set on "POLARITY & MON."

c. Volume Control
   1. Set on high level.

7.05 This test should be made during periods of light traffic.

7.06 Local instructions should be followed with reference to recording any register operation caused by performing these tests.

7.07 METHOD:

a. Insert free end of the 3P7A cord into test jack of switch under test.

b. Press "TEST" Key on QUIK CHEK.
1. Rotary switch will step to the next terminal and continue stepping until terminal 22 is reached.

c. Observe the polarity lamps during this cycle. Flicker of STRAIGHT lamp indicates an "ok" trunk; a flicker of REVERSE lamp, reversed trunk.

d. During the operation of the switch from 1-21 contacts are covered.

8. PULSE CORRECTING REPEATERS

8.01 This section describes a method of rapid testing pulse correcting repeaters from one office to another.

8.02 CORDS REQUIRED:

a. Power Cord — Assembly 2P9A is a 2 conductor cord, 9 feet long, each end equipped with 310 plugs. (see Fig.1)

b. Test Cord — Assembly 3P35A is a 3 conductor cord, 9 feet long, one end equipped with 310 plug and the other end equipped with 240H plug.

8.03 CONNECTIONS:

a. Insert the 310 plug of 2P9A Power Cord into the "TEST" jack of the QUIK CHEK and the 240H plug into the test jacks of the repeater under test.

8.04 TEST SET ARRANGEMENTS:

a. Digit Switch
1. Set in "C" position for continuous pulsing.

b. Function Switch
1. Set on 1400 loop.

c. PPS Switch
1. 12 PPS.

8.05 METHOD:

a. Remove cover of pulse correcting repeater.

b. Press "TEST" Key on CMC 707A TEST SET.

c. Pulses are being sent out to the repeater at 12 PPS with 1400 Loop at 68.5% break.

d. Observe the pulse correcting relays while being pulsed and make any necessary adjustments.

9. CALIBRATION AT CMC

9.01 One (1) day repair and calibration service is available. On air express shipments each way, no more than 3 - 4 days use of the set is lost. The set is repaired (if necessary), defective parts replaced, bench tested and calibrated with a Clevite Brush Mark 220 Recorder. (The chart is returned with set.) The complete cost for minor repairs and calibration is $25.00 plus parts; for majo. repairs and calibration, $40.00, plus parts.

9.02 It is highly recommended that the CMC Quik Chek be returned to Communication Mfg. Co. on a routine six-month basis to ensure accurate calibration and best operating results. However, if the necessary calibration equipment is available and field calibration is desired, complete calibration information can be obtained by writing to Communication Mfg. Co., 3300 E. Spring Street, Long Beach, California 90801.

10. CIRCUIT COMPONENT PARTS

A. Mode (FUNCTION) Switch – 12 positions – 6 wafers.

B. Type "44" Rotary Switch – 3 levels.

C. "DIGIT" Switch – 12 positions – 3 wafers.

D. "TEST" key double pole – Double Throw. Non-locking.

E. "RELEASE" key double pole – Double Throw. Non-locking.

F. Push-to-"TALK" double pole – Double Throw. Non-locking.

G. "PPS" Switch 4 pole – Double Throw. Locking.

H. Printed circuit board – Solid-state Pulsing Circuit.

I. Five Relays "T", "R", "D", "A", "P", P-Pulsing, A-Audio, D-Digit Delay, R-Release, T-Test.

J. Meter – 10-20 MA.

K. Rheostats – Two – 2.5K.

L. Potentiometers – Two 500K & four 50K.

M. Two 24B Lamps (30-45 MA) or two LED's.

N. One TA-9 Module.

O. One Microphone.

P. One Speaker.

Q. One Volume Control 1 Meg.

R. Test Jack.

S. Batt. & Grd. Jack.

10.01 CIRCUIT FUNCTIONS

A. Current Flow "A" relay test.

B. "B" relay release timing test.

C. "C" relay release & rotary speed test.

D. Loop pulsing tests.

E. Leak pulsing tests.

F. Polarity Test.

G. Monitoring and push-to-talk feature.

H. Digit selection control.

11. LUBRICATING REQUIREMENTS — TYPE 44 ROTARY SWITCH

11.01 For best service and maximum life of the QUIK CHEK, it is recommended that Type 44 rotary stepping switch be lubricated after 200,000 revolutions or every six months (whichever is first). Four standard lubricants are used. Each should be mixed thoroughly. Applicator should be a #4 artist's brush for each lubricant. Caution: An applicator should be used for only one lubricant to avoid mixing the lubricants and should be cleaned frequently. The description and symbols of the lubricants are as follows:

a. -Blended lubricating oil. A mineral oil blended with a paraffin base oil. (KS-2832, H-78612-31 or equivalent.)

b. -Watch oil. A highly refined sperm or fish oil that is resistant to gumming and non-corrosive. (KS-6232, H-78612-30 or equivalent.)

c. -Graphite oil. A mixture of blended lubricating oil and deflocculated graphite. (KS-16832-L2, H-78612-9 or equivalent.)

d. -Plastic petroleum. A semi-solid petroleum for wiper bearings. (KS-14774-L1, H-78612-47 or equivalent.)

11.02 PROCEDURE:

a. In these instructions, a dip is defined as the amount of lubricant adhering to the brush applicator after the brush is dipped about 3/8" and wiped across the neck of the bottle to remove any surplus oil.

b. Before lubricating, wipe clean all exposed surfaces.

Caution: Care should be taken to avoid applying an excessive amount of lubricants.

c. Apply one (1) dip of blended oil (KS-2832, H-78612-31, or equivalent) to each of the following lubrication points shown in Fig. 6:

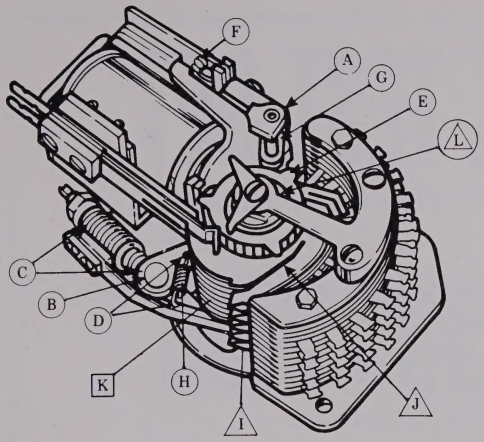


Figure 6

(A) Between the yoke bearing at each end of the yoke.

(B) To the pawl bearing pin, where the pawl and pawl pin contact the armature.

(C) Between the driving spring coil and seats.

(D) Between the pawl spring mounting holes and springs.

(E) On the off-normal cam lobes of indicator wheel.

(F) To the interrupter spring buffers.

(G) To the felt sleeve on the yoke bearing pin. Apply several dips until it appears well saturated, but without excessive oil on the surface.

(H) To the felt wick inside the pawl spring until it appears well saturated.

d. Apply watch oil (KS-6232, H-78612-30, or equivalent) sparingly to the points shown in Fig. 6:

△I To the wiper tips. Several wiper tips may be lubricated with one dip.

△J To the brush springs near the hub assembly.

e. Apply one (1) dip of graphite oil KS-16832-L2, H-78612-9, or equivalent) to the following point:

[K] To the ratchet teeth while the wiper assembly is rotating.
Place set in "C" (continuous pulsing) and "POLARITY & MON." positions. Press "TEST" button, which will operate rotary switch with batt. & grd. connected to unit.

f. Apply plastic petroleum grease to the following point:

△L The shaft after replacing wiper assemblies. Wiper shafts are lubricated for the lifetime of the wiper assembly.

PROTECT YOUR

QUIK CHEK® TEST SET

WITH THE CMC 707 - 710 CARRYING CASE

- PRE SHRUNK ARMY DUCK CANVAS - PEARL GRAY.
- URETHANE PLASTIC FOAM PADDING.
- MASONITE INNER BOTTOM.
- VELCRO FASTENER.
- CONVENIENT CARRYING STRAPS.
- CLEAR PLASTIC IDENTIFICATION POCKET.

Additional protection for the CMC 707 and 710 QUIK CHEK Test Set is available in the form of the QUIK CHEK CARRYING CASE. It is a specially designed canvas padded instrument case, and is especially recommended for use with those QUIK CHEK Test Sets assigned to PBX Installer-Repairmen and for those that are frequently shipped from one work location to another.

The QUIK CHEK Test Set can be easily and quickly placed into the Carrying Case, and the top is held snuggly in place with velcro fasteners.

MODEL 710-I

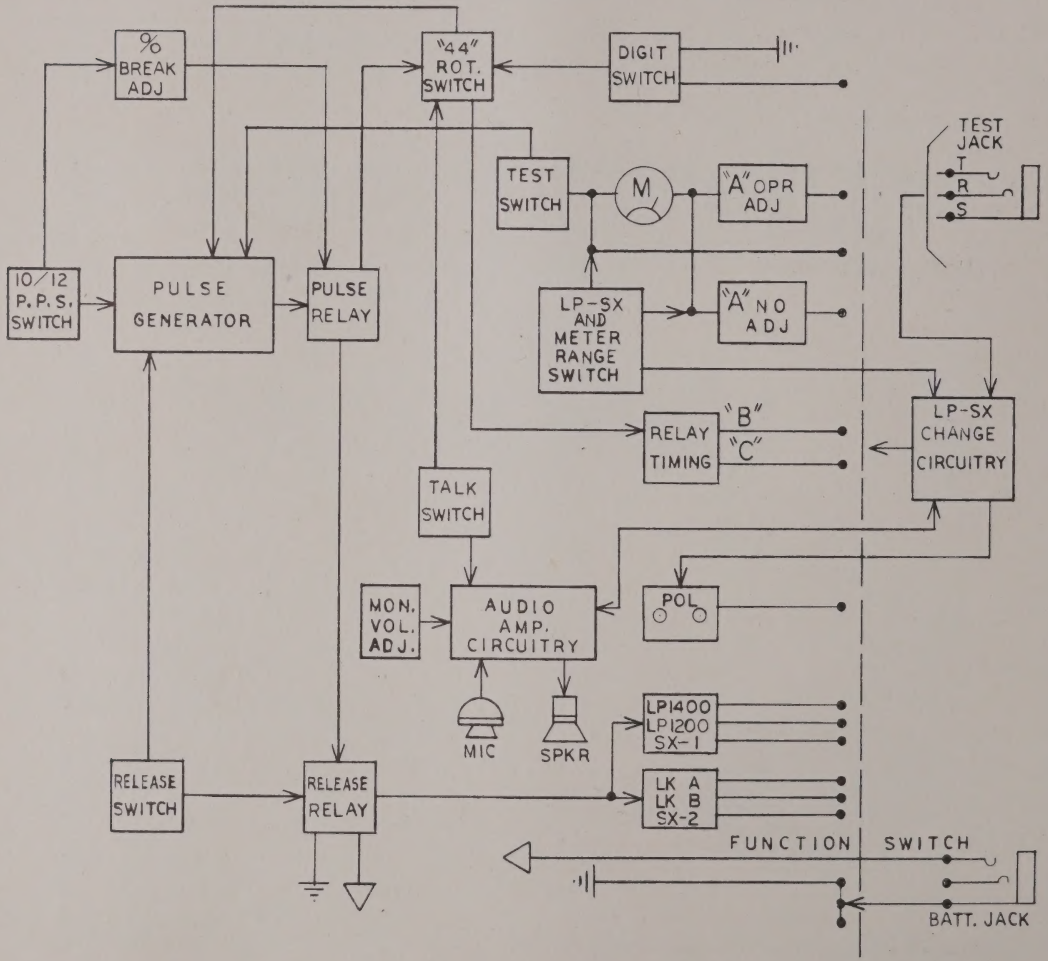
QUIK CHEK® TEST SET

- LOOP & SIMPLEX DIALING
- LOCAL & TOLL TRAIN

OPERATING INSTRUCTIONS

- BLOCK DIAGRAM
- WARRANTY

710 QUIK CHEK BLOCK DIAGRAM



12. GENERAL

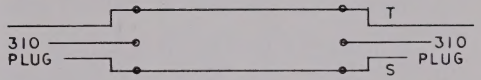
12.01 This section provides instructions on the use and operation of the CMC 710 A QUIK CHEK TEST SET. This Set shall be used for determining repairs on PBX, CDO and large Step-by-Step offices on both local and toll switch trains. In addition to performing the tests on local trains made by the CMC 707A QUIK CHEK TEST SET (described in Sections 1 through 9 of these instructions), it can test the operating features of intertoll selectors, combined intertoll, toll transmission selectors, and intertoll through selectors with both loop and simplex pulsing circuits.

12.02 The CMC 710A features a dual range meter for checking "A" relays at both 10-20 mills and 20-40 mills depending on which circuits are being tested. It also checks "B" relay release timing at 500 or 750 mill sec., "C" Release and Rotary Speed Test. It will check polarity of local switches and trunks, and any digit absorbing features. The operator can monitor tones and announcements and any switch noise, and talk over circuits when required. Complete loop and leak test can be performed and simplex testing with two test values.

12.03 CORDS REQUIRED

A. Power Cord: Assembly 2P9A is a 2-conductor cord, 9 feet long, each end equipped with 310 plugs.

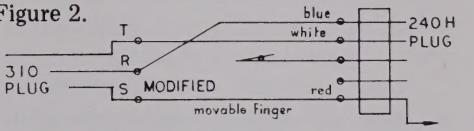
Figure 1.



For offices and dial PBX's equipped with battery and ground "clip-on terminals", use a 2W12A cord assembly, one end of which is equipped with a 310 plug and the other equipped with alligator clips.

B. Test Cord: Assembly 3P35A is a 3-conductor cord, 9 feet long, one end equipped with a 310 plug and the other end equipped with a 240H plug.

Figure 2.



12.04 CONNECTIONS:

A. Insert the 310 plug of the power cord into "BATT" jack on the face of the QUIK CHEK and connect the other end to 48V C.O. battery.

B. Insert the 310 plug of the test cord into the "TEST" jack of the QUIK CHEK and the 240H plug into the switch test jack.

12.05 TEST SET ARRANGEMENTS:

A. CONVERSION SWITCH: In the center under the meter marked LP 10-20 and SX 20-40. This switch converts the 710A from loop operation to

simplex operation, and changes the meter from the 20 to the 40 mill scale.

B. DIGIT SWITCH: At lower left corner of face plate and numbered "1-0", "C" and "CAL." Pulses correspond to the digit selected. "C" provides continuous pulsing, "CAL" is used to calibrate the Set.

C. FUNCTION SWITCH: At lower right corner of face plate. Provides for the series of tests described in paragraph 13.01D and 14.01D.

D. TEST & RLS: (Release Buttons) Located between DIGIT and FUNCTION SWITCHES.

E. RECEIVER — TRANSMITTER: Used to check tones and recorded announcements. A "TALK" button and "VOLUME" control give the QUIK CHEK an amplified push-to-talk circuit.

F. MILLIAMMETER: With two scales 10-20 mills and 20-40 mills for margining "A" relays on both simplex and loop circuits.

G. OPR. ADJ. — N.O. ADJ: For setting variable current flow values on operate and non-operated settings.

H. "10 PPS — 12 PPS": Either 10 or 12 pulses per second can be supplied to the switch under test. (B & C relay test must be made using 12 PPS.)

I. POLARITY: STRAIGHT lamp or LED for straight and REVERSE lamp or LED for reverse. (Not used in simplex.)

J. BATT AND TEST JACKS: In top of panel provide patching arrangements to C.O. battery and switch under test.

K. 750 MS: (Test value "B" release.) Functions only with FUNCTION SWITCH in "B RLS" position. Push to change timing value.

13. TEST FOR LOOP SWITCHES

13.01 PRELIMINARY

A. Insert the power and test cords as outlined in paragraph 12.04.

B. Operate CONVERSION SWITCH to "LP 10-20" position. (This converts the set to loop functions.)

C. Turn the FUNCTION SWITCH to the "A SOAK" position. Push "TEST" button. Turn FUNCTION SWITCH to "A OPR." position, push the "TEST" button and adjust the milliammeter reading to the test value (15.1), readjust value (14.8) or other desired value by turning "OPR. ADJ." knob. Release "TEST" button. Return the FUNCTION SWITCH to "A SOAK" position. Push "TEST" button to soak the "A" relay. Release "TEST" button. Turn the FUNCTION SWITCH to the "A N.O." position. Push the "TEST" button and adjust the meter to the test value (13.9), readjust value (14.4) or other desired value by turning the "N.O. ADJ" knob. Release "TEST" button.

D. The following tests are made by selecting the proper settings on the FUNCTION SWITCH:

LOOP 10-20

1. A OPR	10-20 Mills
2. A SOAK	Short
3. A N.O.	10-20 Mills
4. B RLS.	500 MS
5. C RLS. & ROT.	375 MS 1 x 9
6. POLARITY & MON.	Push to Talk
7. LP 1400	10 or 12 PPS, 68.5%
8. LK A	10 or 12 PPS, 60.5%
9. LP 1200	10 or 12 PPS, 68.5%
10. LK B	10 or 12 PPS, 60.5%
11. SX-1	NA
12. SX-2	NA

The QUIK CHEK is ready for routine use.

E. If a subscriber is encountered during any test through misdialing or plugging into a busy switch, the QUIK CHEK operator may converse with him by turning the FUNCTION SWITCH to the "POLARITY & MON" setting and operating the "TALK" button.

14. TEST FOR SIMPLEX SWITCHES

14.01 PRELIMINARY

A. Insert the power and test cords as outlined in paragraph 12.04.

B. Operate CONVERSION SWITCH to "SX 20-40" position. (This converts the Set to simplex functions.

C. Turn the FUNCTION SWITCH to the "A SOAK" position. Push "TEST" button. Turn FUNCTION SWITCH to the "A OPR" position, push the "TEST" button and adjust the milliammeter reading to the test value (37.0), readjust value (36.0) or other desired value by turning the "OPR. ADJ." knob. Release "TEST" buttton. Return the FUNCTION SWITCH to the "A SOAK" position. Push "TEST" button to soak the "A" relay. Release "TEST" button. Turn FUNCTION SWITCH to the "A N.O." position. Push the "TEST" button and adjust the meter to the test value (32.5), readjust value (33.5) or other desired value by turning the "N.O. ADJ" knob. Release "TEST" button.

D. The following tests are made by selecting the proper settings on the FUNCTION SWITCH:

SIMPLEX 20-40

1. A OPR.	20-40 Mills
2. A SOAK	Short
3. A N.O.	20-40 Mills
4. B RLS.	500 —MS
5. C RLS. & ROT.	375 —MS 1 x 9
6. POLARITY & MON.	Monitor Push-to-Talk
7. LP 1400	NA
8. LK A	NA
9. LP 1200	NA
10. LK B	NA
11. SX-1	10 or 12 PPS, 68.5%
12. SX-2	10 or 12 PPS, 60.5%

The QUIK CHEK is ready for routine use.

E. If a subscriber is encountered during any test through misdialing or plugging into a busy switch, the QUIK CHEK operator may converse with him by operating the "TALK" button — regardless of the position of the FUNCTION SWITCH.

15. STEP-BY-STEP TESTS

15.01 This covers the tests which may be made with the QUIK CHEK TEST SET (model CMC 710A) on Step-by-Step switches in all types of Step-by-Step offices, including CDO's, Centrex, PBX's, including Toll Equipment. The CMC 710A QUIK CHEK TEST SET replaces the pulsing set and the applique circuit required for making pulsing tests on switches designed for simplex dialing. In addition, it provides for the standard tests performed by the CMC 707A QUIK CHEK TEST SET.

15.02 THE TESTS ARE AS FOLLOWS:

A. "A" RELAYS: This is a QUIK CHEK of "A" relays using the current flow test values specified in the circuit requirement tables.

B. "B" RELAY RELEASE: This is a QUIK CHEK of the "B" relay releasing time.

C. "C" RELAY RELEASE AND ROTARY SPEED TEST: This is a QUIK CHEK of the "C" relay releasing time, cut in, and rotary stepping.

D. POLARITY: This is a QUIK CHEK of the continuity and polarity of switches and selector level trunks.

E. DIGIT ABSORBING: This is a QUIK CHEK of the digit absorbing features of selectors.

F. LOOP PULSING: This is a QUIK CHEK method of making loop pulsing tests on selectors and connectors.

G. LEAK PULSING: This is a QUIK CHEK method of making leak pulsing tests on selectors and connectors.

H. SIMPLEX PULSING: This is a QUIK CHEK method of making simplex pulsing tests on toll selectors and connectors.

16. PREPARATION FOR ALL TESTS

16.01 LOOP DIALING: When used on local switch trains, the "CONVERSION SWITCH" should be operated to the "LP 10-20" position. Otherwise the "PREPARATION FOR ALL TESTS" described in paragraph 5, page 4 applies.

16.02 SIMPLEX DIALING: When used on toll switch trains using simplex switch, the "CONVERSION SWITCH" should be operated to the "SX 20-40" position. Otherwise the "PREPARATION FOR ALL TESTS" described in paragraph 5, page 4 applies. (LP. 750 and LK. 16K are not provided on the CMC 710A.)

17. METHOD

17.01 LOOP DIALING: The "STEPS", "ACTIONS" and "VERIFICATIONS" listed in paragraph 6, pages 4 through 13, and paragraph 7 and 8, pages 13 and 14 apply.

17.02 SIMPLEX DIALING: In addition to providing the standard tests performed by the CMC 707A QUIK CHEK TEST SET, the CMC 710A model replaces the pulsing set and the applique circuit required for making pulsing tests on switches designed for simplex dialing.

17.03 NOTE: When the CMC 710A QUIK CHEK is being USED IN THE "SX 20-40" position, and a subscriber is encountered during any test through misdialing, or plugging into a busy switch, the operator may converse with him by operating the "TALK" button — regardless of the position of the FUNCTION SWITCH.

17.04 The following tests are not applicable to the CMC 710A QUIK CHEK when the "CONVERSION SWITCH" is in the "SX 20-40" position:

POLARITY & MONITOR —Polarity Test — N.A.
—Monitor & Talk — Available

LP 1400
LK A
LP 1200
LK B

17.05 TESTS: Unless otherwise noted, the "STEPS", "ACTIONS" and "VERIFICATIONS" described in connection with the CMC 707A QUIK CHEK under paragraph 6 "METHOD" (pages 4 through 11) apply.

STEP	ACTION	VERIFICATION
(A)	"A" RELAY TEST Same as for CMC 707-A, using appropriate operate and non-operate values.	
(B)	"B" RELAY RELEASE TEST Same as for CMC 707-A.	
(C)	"C" RELAY RELEASE & ROTARY TEST (SELECTORS) Same as for CMC 707-A.	

STEPS	ACTIONS	VERIFICATIONS
	(D) POLARITY TEST OF TRUNKS FROM SELECTOR LEVELS Not Applicable when being used on Simplex dialing.	
	(E) DIGIT ABSORBING TEST Same procedure as for CMC 707 A, but FUNCTION SWITCH should be in "SX-1" or "SX-2" position.	
	(F) LOOP PULSING TEST Not Applicable.	
	(G) LEAK PULSING TEST Not Applicable.	
	(H) SX-1 (Critical Test on Office 750 ohm path.)	
3	Operate the FUNCTION SWITCH to the "SX-1" position.	
4	Operate the "DIGIT" switch to "9".	
5	Insert the 240H plug into the test jack of the switch under test.	Switch is seized.
6	Operate the "TEST" key momentarily.	The switch steps up to level 9 and cuts through to the first idle trunk.
7	Operate "RLS" key and remove the 240H plug from the switch under test.	Switch restores to normal.
8	Repeat steps 5, 6 and 7 until all switches have tested.	

STEPS	ACTIONS	VERIFICATIONS
	(I) SX-2 It is only necessary to use SX-2 when the toll train does not meet the pulsing requirements imposed by the SX-1 tests. The SX-2 test provides a 250 ohm path - - - similar to the requirements of normal trunks.	
3-9	Repeat steps 3-8 as described under SX-1.	

PROTECT YOUR

QUIK CHEK® TEST SET

WITH THE CMC 707 - 710 CARRYING CASE

- PRE SHRUNK ARMY DUCK CANVAS - PEARL GRAY.
- URETHANE PLASTIC FOAM PADDING.
- MASONITE INNER BOTTOM.
- VELCRO FASTENER.
- CONVENIENT CARRYING STRAPS.
- CLEAR PLASTIC IDENTIFICATION POCKET.

Additional protection for the CMC 707 and 710 QUIK CHEK Test Set is available in the form of the QUIK CHEK CARRYING CASE. It is a specially designed canvas padded instrument case, and is especially recommended for use with those QUIK CHEK Test Sets assigned to PBX Installer-Repairmen and for those that are frequently shipped from one work location to another.

The QUIK CHEK Test Set can be easily and quickly placed into the Carrying Case, and the top is held snuggly in place with velcro fasteners.

MODEL 710-I

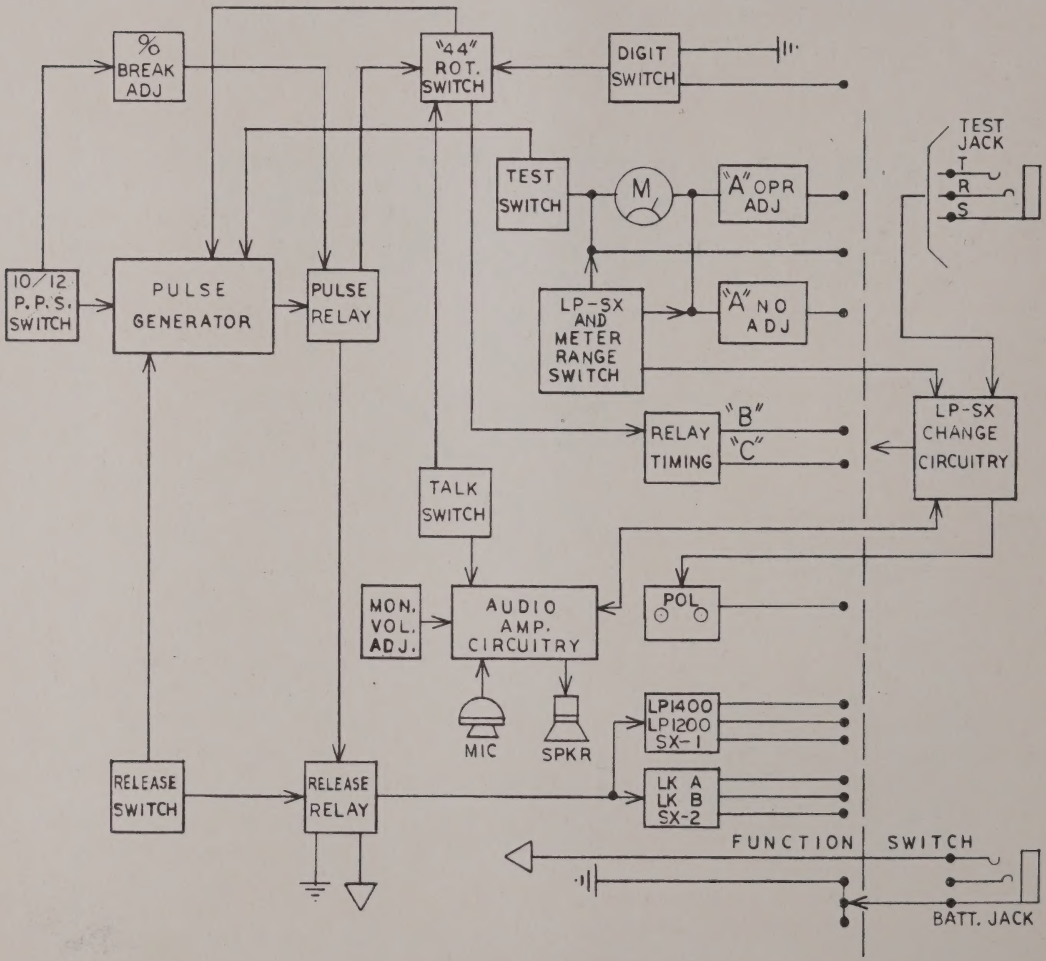
QUIK CHEK® TEST SET

- LOOP & SIMPLEX DIALING
- LOCAL & TOLL TRAIN

OPERATING INSTRUCTIONS

- BLOCK DIAGRAM
- WARRANTY

710-I QUIK CHEK BLOCK DIAGRAM



18. GENERAL

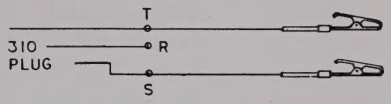
18.01 This section provides instructions on the use and operation of the CMC 710-I QUIK CHEK TEST SET. This set shall be used for determining repairs on PBX, CDO and large Step-by-Step offices on both local and toll switch trains. In addition to performing the tests on local trains made by the CMC 707-B QUIK CHEK TEST SET (described in Sections 1 through 9 of these instructions), it can test the operating features of intertoll selectors, combined intertoll, toll transmission selectors and intertoll through selectors with both loop and simplex pulsing circuits.

18.02 The CMC 710-I features a dual range meter for checking "A" relays at both 10-20 mills and 20-40 mills, depending on which circuits are being tested. It also checks "B" relay release timing at 375 or 500 mill sec., "C" Release and Rotary Speed Test. It will check polarity of local switches and trunks and any digit absorbing features. The operator can monitor tones and announcements and any switch noise, and talk over circuits when required. Complete loop and leak test can be performed and simplex testing with two test values.

18.03 CORDS REQUIRED

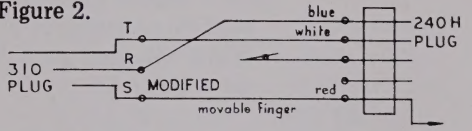
A. Power Cord: Assembly 2W12A is a 2-conductor cord, 9 feet long, one end of which is equipped with a 310 plug and the other equipped with alligator clips.

Figure 1.



B. Test Cord: Assembly 3P35A is a 3-conductor cord, 9 feet long, one end equipped with a 310 plug and the other end equipped with a 240H plug.

Figure 2.



18.04 CONNECTIONS

A. Insert the 310 plug of the power cord into "BATT" jack on the face of the QUIK CHEK and connect the other end to 48V C.O. battery.

B. Insert the 310 plug of the test cord into the "TEST" jack of the QUIK CHEK and the 240H plug into the switch test jack.

18.05 TEST SET ARRANGEMENTS

A. Conversion Switch: In the center under the meter marked LP 10-20 and SX 20-40. This switch converts the 710-I from loop operation to simplex operation and changes the meter from the 20 to the 40 mill scale.

B. Digit Switch: At lower left corner of face plate and numbered "1-0", "C" and "CAL". Pulses correspond to the digit selected. "C" provides continuous pulsing, "CAL" is used to calibrate the set.

C. Function Switch: At lower right corner of face plate. Provides for the series of tests described in paragraph 19.01D and 20.01D.

D. Test & Rls: (Release Buttons). Located between DIGIT and FUNCTION SWITCHES.

E. Receiver – Transmitter: Used to check tones and recorded announcements. A "TALK" button and "VOLUME" control give the QUIK CHEK an amplified push-to-talk circuit.

F. Milliammeter: With two scales 10-20 mills and 20-40 mills for margining "A" relays on both simplex and loop circuits.

G. OPR. ADJ. – N.O. ADJ: For setting variable current flow values on operate and non-operate settings.

H. "10 PPS – 12 PPS": Either 10 or 12 pulses per second can be supplied to the switch under test. (B & C relay test must be made using 12 PPS.)

I. Polarity: STRAIGHT or REVERSE lamp or LED illuminates. (Not used in simplex.)

J. BATT and Test Jacks: In top of panel provide patching arrangements to C.O. battery and switch under test.

K. 500 MS: (Test value "B" release.) Functions only with FUNCTION SWITCH in "B RLS" position. Push TALK SWITCH to change timing value.

19. TEST FOR LOOP SWITCHES

19.01 PRELIMINARY

A. Insert the power and test cords as outlined in paragraph 18.05.

B. Operate CONVERSION SWITCH to "LP 10-20" position. (This converts the set to loop functions.)

C. Turn the FUNCTION SWITCH to the "A SOAK" position. Push "TEST" button. Turn FUNCTION SWITCH to "A OPR." position, push the "TEST" button and adjust the milliammeter reading to the test value (15.1), readjust value (14.8) or other desired value by turning "OPR. ADJ" knob. Release "TEST" button. Return the FUNCTION SWITCH to "A SOAK" position. Push "TEST" button to soak the "A" relay. Release "TEST" button. Turn the FUNCTION SWITCH to the "A N.O." position. Push the "TEST" button and adjust the meter to the test value (13.9), readjust value (14.4) or other desired value by turning the "N.O. ADJ" knob. Release "TEST" button.

D. The following tests are made by selecting the proper settings on the FUNCTION SWITCH:

LOOP 10-20

1. A OPR – 10-20 Mills
2. A SOAK – Short
3. A N.O. 10-20 Mills
4. B RLS. – 375 MS
5. C RLS. & ROT. – 375 MS 1x 9
6. Polarity & Mon. – Push-to-Talk
7. LP 1400 – 10 or 12 PPS, 68.5%
8. LK A – 10 or 12 PPS, 60.5%
9. LP 1200 – 10 or 12 PPS, 68.5%
10. LK B – 10 or 12 PPS, 60.5%
11. SX-1 – NA
12. SX-2 – NA

The QUIK CHEK is ready for routine use.

E. If a subscriber is encountered during any test through misdialing or plugging into a busy switch, the QUIK CHEK operator may converse with him by turning the

FUNCTION SWITCH to the "POLARITY & MON." setting and operating the "TALK" button.

20. TEST FOR SIMPLEX SWITCHES

20.01 PRELIMINARY

A. Insert the power and test cords as outlined in paragraph 18.05.

B. Operate CONVERSION SWITCH to "SX 20-40" position. (This converts the set to simplex functions.)

C. Turn the FUNCTION SWITCH to the "A SOAK" position. Push "TEST" button. Turn FUNCTION SWITCH to the "A OPR" position, push the "TEST" button and adjust the milliammeter reading to the test value (37.0), readjust value (36.0) or other desired value by turning the "OPR. ADJ." knob. Release "TEST" button. Return the FUNCTION SWITCH to the "A SOAK" position. Push "TEST" button to soak the "A" relay. Release "TEST" button and adjust the meter to the test value (32.5), readjust value (33.5) or other desired value by turning the "N.O. ADJ" knob. Release "TEST" button.

D. The following tests are made by selecting the proper settings on the FUNCTION SWITCH:

SIMPLEX 20-40

1. A OPR – 20-40 Mills
2. A SOAK – Short
3. A N.O. – 20-40 Mills
4. B RLS. – 375 MS
5. C RLS. & ROT. – 375 MS 1 x 9
6. Polarity & Mon. – Monitor Push-to-Talk
7. LP 1400 – NA
8. LK A – NA
9. LP 1200 – NA
10. LK B – NA
11. SX-1 – 10 or 12 PPS, 68.5%
12. SX-2 – 10 or 12 PPS, 60.5%

The QUIK CHEK is ready for routine use.

E. If a subscriber is encountered during any test through misdialing or plugging into a busy switch, the QUIK CHEK operator may converse with him by operating

the "TALK" button – regardless of the position of the FUNCTION SWITCH.

21. STEP-BY-STEP TESTS

21.01 This covers the tests which may be made with the QUIK CHEK TEST SET (model CMC 710-I) on Step-by-Step switches in all types of Step-by-Step offices, including CDO's, Centrex, PBX's and Toll Equipment. The CMC 710-I QUIK CHEK TEST SET replaces the pulsing set and the applique circuit required for making pulsing tests on switches designed for simplex dialing. In addition, it provides for the standard tests performed by the CMC 707-B QUIK CHEK TEST SET.

21.02 THE TESTS ARE AS FOLLOWS:

A. "A" Relays: This is a QUIK CHEK of "A" relays using the current flow test values specified in the circuit requirement tables.

B. "B" Relay Release: This is a QUIK CHEK of the "B" relay releasing time.

C. "C" Relay Release and Rotary Speed Test: This is a QUIK CHEK of the "C" relay releasing time, cut in, and rotary stepping.

D. Polarity: This is a QUIK CHEK of the continuity and polarity of switches and selector level trunks.

E. Digit Absorbing: This is a QUIK CHEK of the digit absorbing features of selectors.

F. Loop Pulsing: This is a QUIK CHEK method of making loop pulsing tests on selectors and connectors.

G. Leak Pulsing: This is a QUIK CHEK method of making leak pulsing tests on selectors and connectors.

H. Simplex Pulsing: This is a QUIK CHEK method of making simplex pulsing tests on toll selectors and connectors.

22. PREPARATION FOR ALL TESTS

22.01 LOOP DIALING: When used on local switch trains, the "CONVERSION SWITCH" should be operated to the "LP 10-20" position. Otherwise the "PREPARATION FOR ALL TESTS" described in paragraph 5, page 4 applies.

22.02 SIMPLEX DIALING: When used on

toll switch trains using simplex switch, the "CONVERSION SWITCH" should be operated to the "SX 20-40" position. Otherwise the "PREPARATION FOR ALL TESTS" described in paragraph 5, page 4 applies. (LP. 750 and LK. 16K are not provided on the CMC 710-I.)

23. METHOD

23.01 LOOP DIALING: The "STEPS", "ACTIONS" and "VERIFICATIONS" listed in paragraph 6, pages 4 through 13, and paragraph 7 and 8, pages 13 and 14 apply.

23.02 SIMPLEX DIALING: In addition to providing the standard tests performed by the CMC 707-B QUIK CHEK TEST SET, the CMC 710-I model replaces the pulsing set and the applique circuit required for making pulsing tests on switches designed for simplex dialing.

23.03 NOTE: When the CMC 710-I QUIK CHEK is being USED IN THE "SX 20-40" position, and a subscriber is encountered during any test through mis-dialing, or plugging into a busy switch, the operator may converse with him by operating the "TALK" button – regardless of the position of the FUNCTION SWITCH.

23.04 The following tests are not applicable to the CMC 710-I QUIK CHEK when the "CONVERSION SWITCH" is in the "SX 20-40" position:

POLARITY & MONITOR – Polarity Test – N.A.; Monitor & Talk – Available

LP 1400
LK A
LP 1200
LK B

23.05 TESTS: Unless otherwise noted, the "STEPS", "ACTIONS" and "VERIFICATIONS" described in connection with the CMC 707-B QUIK CHEK under paragraph 6 "METHOD" (pages 4 through 11) apply.

STEP	ACTION	VERIFICATION
(A)	"A" RELAY TEST Same as for CMC 707-B using appropriate operate and non-operate values.	

STEP	ACTION	VERIFICATION
	(B) "B" RELAY RELEASE TEST Same as for CMC 707-B	
	(C) "C" RELAY RELEASE & ROTARY TEST (SELECTORS) Same as for CMC 707-B	
	(D) POLARITY TEST OF TRUNKS FROM SELECTOR LEVELS Not applicable when being used in Simplex dialing.	
	(E) DIGIT ABSORBING TEST Same procedure as for CMC 707-B, but FUNCTION SWITCH should be in "SX-1" or "SX-2" position.	
	(F) LOOP PULSING TEST Not applicable.	
	(G) LEAK PULSING TEST Not applicable.	
	(H) SX-1 (Critical Test on Office 750 ohm path.)	
3	Operate the FUNCTION SWITCH to the "SX-1" position.	
4	Operate the "DIGIT" switch to "9".	
5	Insert the 240H plug into the test jack of the switch under test.	Switch is seized.

STEP	ACTION	VERIFICATION
6	Operate the "TEST" key momentarily.	The switch steps up to level 9 and cuts through to the first idle trunk.
7	Operate "RLS" key and remove the 240H plug from the switch under test.	Switch restores to normal.
8	Repeat steps 5, 6 and 7 until all switches have tested.	
(I)	SX-2 It is only necessary to use SX-2 when the toll train does not meet the pulsing requirements imposed by the SX-1 tests.	
3-9	The SX-2 test provides a 240 ohm path – similar to the requirements of normal trunks. Repeat steps 3-8 as described under SX-1.	

Warranty

We agree that we will repair or exchange, at our option, any part, or parts, returned to us within 90 days of the receipt of the CMC QUIK CHEK Test Set which appear defective in material or workmanship and which our examination shall disclose, to our satisfaction, to be thus defective.

This Warranty does not apply to the QUIK CHEK or any part thereof which has been subjected to accident, alteration, abuse, misuse, damage caused by water, fire or act of God, or which has been used on circuits or voltages other than the normal 48-50 V central office power supply. This Warranty is in lieu of all other agreements, expressed or implied, and we neither assume or authorize any other person to assume for us any obligation or liability in connection with the sale of the QUIK CHEK Test Set.

Communication Mfg. Co. reserves the right: to revise, change or modify the construction of the CMC QUIK CHEK Test Set, or any part, or parts thereof, without incurring any obligation to make such changes or modifications when making repairs or replacements under this Warranty; and in replacing parts under the provisions of this Warranty to furnish an identical part or a part that, in Communication Mfg. Co.'s judgment, is equivalent to the part replaced.

Any QUIK CHEK Test Set returned for repair within a 30 day period of its purchase, will be repaired or exchanged on a "NO COST" basis. Return shipping charges will be borne by Communication Mfg. Co. A set returned during the 31-90 day period of its warranty will be repaired or exchanged on a "NO CHARGE" basis, with shipping charges being paid by the purchaser.

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